who had sustained fat embolism. For the purposes of the present investigation three blood samples were taken from an arm vein in each patient; the first after the induction of anaesthesia but before insertion of the pertrochanteric needle; the second five minutes after the first injection of contrast material; and the third 20 minutes later. The blood was allowed to clot and the plasma then examined for the presence of fat globules by the method of Gurd.[4] This method relies on the separation of the fat globules from plasma by its passage through an 8-μm pore size micropore filter. Any fat globules from the plasma are trapped on the filter and can be seen under the microscope after staining with Sudan IV. The triglyceride levels are also measured in the filtrate and compared with those measured in the plasma before filtration. A fall in the triglyceride level confirms that fat has been filtered out. This method was validated by examining blood from two patients with known fat embolism and by examining blood to which fat had been added.

No evidence of circulating fat globules was detected in the blood of 17 of the 18 patients studied. A few fat globules were found in the two post-injection samples from one patient, but there was no significant difference in the plasma triglyceride levels before and after filtration. All 18 patients remained well after phlebography and none showed any symptoms of a fat embolism syndrome. Multiple fat globules were seen on the filter after passage of plasma from the two patients examined who were known to be suffering from traumatic fat embolism.

Conclusion

Although one of the 18 patients undergoing phlebography showed evidence of a few circulating fat globules, subclinical fat embolism is not common after pertrochanteric phlebography. About 200 pertrochanteric phlebograms have been performed at St Thomas's Hospital during the last six years and only one episode of clinically apparent fat embolism has occurred. We believe therefore that while the clinician and the radiologist should be aware of the possibility of its occurrence in patients undergoing intraosseous phlebography, it is not a contraindication to this valuable technique, for which there is sometimes no alternative.

We acknowledge the help of the staff of the department of chemical pathology, St Thomas's Hospital, who performed the plasma triglyceride estimations.

[1] Young, A E, *et al*, *British Medical Journal*, 1973, **4**, 592.
[2] Lea Thomas, M, and Tighe, J R, *Lancet*, 1973, **2**, 1415.
[3] Lea Thomas, M, and Fletcher, E W L, *Clinical Radiology*, 1967, **18**, 369.
[4] Gurd, A R, *Journal of Bone and Joint Surgery*, 1970, **52B**, 732.

St Thomas's Hospital, London SE1 7EH
A E YOUNG, MA, FRCS, lecturer in surgery
M LEA THOMAS, FRCP, FRCR, consultant radiologist
N L BROWSE, MD, FRCS, professor of vascular surgery

Therapeutic value of a supporting brassière in mastodynia

Pain in the breast is common, and there are relatively few women who do not experience premenstrual discomfort and tenderness at some time during reproductive life. Most of those who seek medical advice are satisfied with reassurance that they do not have cancer of the breast, but about 6% experience severe and persistent pain that requires some form of treatment in addition to reassurance. The cause of mastodynia is seldom fully understood. In many patients clinical features of fibroadenosis or duct ectasia are present but in others the symptoms seem to arise from the mechanical effect of heavy, pendulous breasts. Whatever the cause, most authorities agree that adequate support for the breasts is an important part of treatment.[1 2] Strapping with adhesive plaster has been suggested[3] but is not practical as a long-term measure and most surgeons recommend a firm supporting brassière. For various reasons this advice is often disregarded and even when it is followed the brassière selected may be inappropriate for the patient's needs.

Methods and results

Between 1 March 1974 and 31 December 1975 114 patients were individually fitted with a special brassière as the sole means of treatment. Treatment was considered necessary when two of the following questions were answered in the affirmative: (1) Does the pain last for more than seven days each menstrual cycle? (2) Does the pain interfere with daily activities? (3) Does the pain waken you at night? (4) Do you consider the pain severe enough to justify treatment? In 78 women clinical features of fibroadenosis were present, 9 had clear evidence of duct ectasia, and in the remaining 27 no definite abnormality was apparent on clinical examination or mammography but each required a large brassière cup size, and the cause of the pain may have been mechanical. A member of the nursing staff was trained by Memory World (UK) Limited to fit their brassière, which was chosen because it is designed on the cantilever principle and ensures that 75% of the weight of the breasts is distributed across the back and not on the shoulder straps. The side panels are shaped so that the brassière stays in place during any activity. It is provided in 144 different sizes to enable accurate fitting for any figure. Each patient was fitted and supplied with two brassières and followed up every three months for six to 18 months. The results were assessed and graded by two observers independently as follows: grade 1 = complete relief of symptoms; grade 2 = improved but some residual pain or discomfort; grade 3 = no improvement, or worse. The two observers agreed in all but six patients.

Ten patients who were lost to follow up and four who did not wear their brassière consistently were excluded from the results (table). Of the remaining 100 patients 26 obtained complete relief from pain, 49 were improved, 21 received no benefit from the brassière, and 4 became worse. Fifteen patients had received previous drug treatment for mastodynia, and of these 11 experienced improvement or relief of pain when they wore the brassière.

Clinical findings and response to treatment

	Total	Grade of result		
		1	2	3
Patients with fibroadenosis	68	15	38	15
Patients with duct ectasia	9	2	3	4
Patients with mechanical pain	23	9	8	6

Of the 68 patients with clinical and radiological fibroadenosis 15 obtained complete relief, 38 were improved, and 15 were the same or worse. There was no correlation between the age of the patient or of the brassière cup size and the relief of symptoms.

Discussion

It is difficult to assess objectively a subjective symptom such as mammary pain. We have tried to reduce observer error by using standard questions and two observers to assess the replies, but a patient's attitude towards pain varies from day to day, which is a major weakness in this and similar trials. Relief of pain was not related significantly to age, clinical or radiological factors, or size of breasts. Advice about a supporting brassière should not be confined to women with large breasts. It was striking that many patients previously treated with drugs responded to the brassière, so it is desirable to try a supporting brassière before resorting to diuretics or hormones, which may have side effects. Our findings support the clinical impression that a fitted supporting brassière has considerable therapeutic value in many women with mastodynia.

We thank Mrs Upchurch of Memory World (UK) Limited for the supply of brassières, Mrs Ruth Mayes for fitting them, and Mrs Kay Newcomb for secretarial help.

[1] Velpeau, A, *Maladies du Sein*. Paris, Masson, 1854.
[2] Atkins, H J B, *British Journal of Surgery*, 1950, **38**, 147.
[3] Bailey, H, and Love, M, *Short Practice of Surgery*, 13th edn. London, Lewis, 1965.

University Hospital of South Manchester, West Didsbury, Manchester M20 8LR
M C WILSON, MB, FRCS, tutor in surgery
R A SELLWOOD, CHM, FRCS, professor of surgery